

Investing in Africa: A Sustainable Development Investment Model

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Introduction

Finance and Sustainability in Africa

The Opportunity in African Countries

Global Investors can provide a valuable service, whether it is investment banking, capital markets, commercial banking, or asset management – in Africa's Sustainable Development Investment and can simultaneously create sustainable value for African societies. Investors and Corporations can improve the environment, reduce poverty, advance African economies, improve corporate governance, and develop **African Social Entrepreneurs**.

Through the **Sustainable Development Investment Project Management Office (SDIPMO)** and **Sustainable Development Investment Project Management Portfolio (SDIPMP)**, investors can leverage to simultaneously earn a profit and have a positive impact on African society through *Capital Markets* (to address environmental issues including air pollution, climate change, and renewable energy), *Banking* (to reduce poverty), *Project Finance* (to reduce poverty and create infrastructure development), and *Investment Management* (to improve corporate governance in public companies and to develop socially responsible African entrepreneurs).

Private Sector role in Africa's Sustainable Development Investment

Sustainable Development: The Role of Corporations, African Government and International Organizations in Africa

Private sector development can cut the middlemen in the cost of international development process and implementation and route funds efficiently and effectively to the countries population and support of the African countries development. Many strategies found in the corporate sector for growth and development can be employed in international development. Thus, investors can create a new parading of how international development is implemented in sustainable development investment in a cost effective way.

Sustainable Development Investment is in the horizon for Corporation, African governments and international organizations seeking to invest in Africa and it will be facing the challenge of the effects of this external force in its daily business operations and its existence among nations and within its societies. The variables that makes up sustainable development consists of **Economic Prosperity** , which is the maintenance of high and stable levels of economic growth and employment, **Social Equity** ,which is the social progress which recognizes the needs of everyone and **Environmental Sustainability** which is the prudent use of natural resources and effective protection of the environment .

Role of African Government & Social Development

AFRICA ECONOMIC SYSTEM consists of external and internal forces that contribute to the undulation of activity of the organization, consumers and monetary and fiscal policies. Africa's economic resource consists of land, labor, capital and human resource-which when developed and put through education and skill training, becomes human capital. In sustainable development, the future of **investments in**

Africa will be will continue to be **fossil fuels** , and further development in **nuclear energy, renewable energy, energy carriers, combines heat and power (CHP), carbon dioxide capture and storage, decentralize energy and recovered energy**. **Economic Prosperity** is the maintenance of high and stable levels of economic growth and employment. The **external economic** forces are the life cycles, business cycle changes, inflation, interest rates, international economics, consumer sentiments, and technology, government [changes in law, regulation, taxation, and political environment]. The **internal forces** of countries economic system consists of the industries, the companies and labor force. The level of a country's productivity impacts on its long term growth. **Social Equity** is the social progress and the recognition of the basic needs of everyone. Corporation and investors has the unique opportunity to make its Sustainable Development footprint in Africa by increase Africa's productivity so that the population living in poverty and who are not able to acquire jobs to become financially independent can be removed from the sleeping labor supply.

The visible hand of African government intervention is necessary to provide social safety net and welfare to catalyze the population living in poverty into the labor force; the overall wealth of the cities within the countries can materialized through higher level of productivity by a sustainable development microstructure. The role of African government in providing public assistance, welfare programs, education and training, childcare, provision for the physically and mentally challenged and provisions for the elderly to the poorest segment of its population will contribute to the micromanagement of poverty from a country's municipal/local-city level and improved efforts for long term poverty alleviation on a macrolevel, as a form of sustainable development investment.

Role of Corporations, African Government & African Small Businesses

Corporations can be the generator of wealth, knowledge and technology transfer in the African economy. The role of corporation and its participation in the African community in which it conducts its business is a form of sustainable development. Besides, brand equity, goodwill, corporate citizenship, corporations are facing a new external force in the horizon and this is sustainable development, which is the integration of economic, social and environmental forces. The question may arise as to how can these forces, once perceived as independent and specific in its own category and function, contribute to sustainable development investment? The answer lays in the rapid interdependencies and osmosis effect that technology and communications has impacted on these three separate but increasingly interdependent forces. The technological force causes a synergistic effect of economic, social and environmental fabrication that has become sustainable development as the new integrated force in the business environment. The business environment in which the corporations exist does not only face the economic, social and environmental challenges, it now faced the synergistic impact of sustainable development and a need to integrated the equation into its internal and external business environment. Hybrid forces are developing in the business environment due to the impact of technology and communication. The effect that sustainable development has on the firms, calls for a shift in its paradigm for strategic management and sustainable development investment and more active participation in economic, environmental and social development issues.

Conclusively, through bisectoral integration approach, the role of AFRICAN government and the role of CORPORATIONS and INVESTORS, international organizations and institutions for knowledge and dissemination of public information, will achieve sustainable development for its civil society, country by country, state by state and city by city, village by village. Finally, corporations can offset poverty by offering jobs, provide health benefits and education and training programs to the poorest segment of African civil society in an effort for poverty alleviation and achieving sustainable development and mitigate issues of the UN Development Millennium Goal.

INTEGRATING THE GOALS OF ENVIRONMENTAL PROTECTION

The Environment provides commodities and contributes to well being, growth and our daily livelihood. When planning for any economic, social and political activity and implementation of any type of deliverables, it is pertinent to integrate the compatible variable of environmental sustainability. Consideration must be given to integration of the Sustainable Development Equation. The equation is the culmination of management, systems and policies of **Economic Prosperity**, which is the maintenance of high and stable levels of economic growth and employment, **Social Equity**, which is the social progress which recognizes the needs of everyone and **Environmental Sustainability** which is the prudent use of natural resources and effective protection of the environment .The context in which the economic and social systems are enclosed allows for our societies to function and strive. No longer can one system be independent of the other. No longer can one system be more important than the other. It is important to protect the environment to achieve **Sustainable Development Equity (SDE)**. Thus, through the integrations of the sustainable development equation and creating the value of sustainable development equity, firms can achieve a sustainable development biosphere.

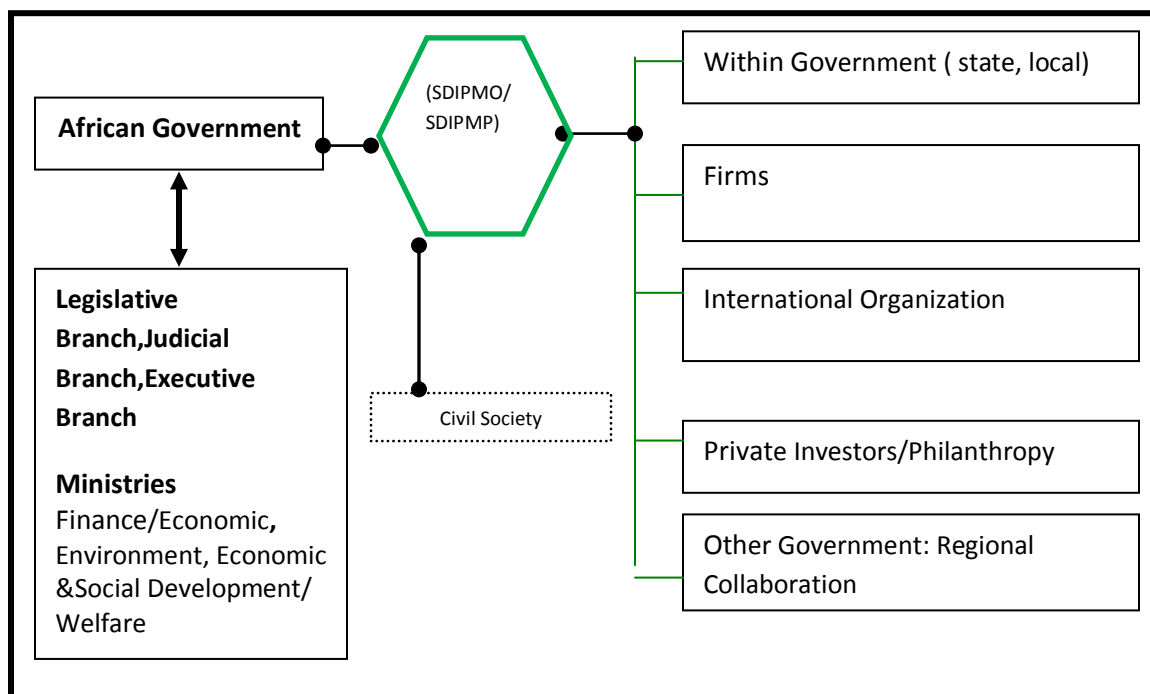
Investors, Corporations and the Business Environment

The production process and final deliverables is the principal way in which the firm engages its business environment, economic environment and natural environment that is business activities (investing, operations and financing) and restructuring in the department of the firms or the value generation pattern will make a big difference in the yield of profits for the firm. Green corporations must be better engineered and evolved through the business cycles and industry life cycles. The existence of the firms in the sustainable business environment depends on whether it can make cheaper and quicker and more efficient products and services, symbiotically with the environment and the consumers' preference, will be around for a long time. The firm is dealing with multi-types of environment and systems when developing strategies to implement a symbiotic relationship with the environment and dealing with global warming and other environmental challenges. Careful consideration must be given to the ecological system of sustainable development and the economic systems in which it functions. The ecological systems of sustainable development consist of five subsystems. Firstly, the business environment consists of the firm, government, international organizations and institution of innovations and knowledge [i.e. academia], competitors within the designated industries, other nations and development environment, makes up the **Sustainable Development Microsystems (SDM)**. Secondly, there will be a systems of interconnectivity between the immediate environments, where the country's firms, government, international organizations and institution in its domestic environment for

innovations, knowledge research & development, which is known as the **Sustainable Development Mesosystem (SDMe)**. Thirdly, the country's external environment setting, such as the domestic economic system will affect development, which is known as **Sustainable Development Exosystem (SDE)**. Fourthly, the countries larger cultural context in its strategic geographical position of national economy, political culture and its subculture, which is known as **Sustainable Development Macrosystem (SDMa)**. These ecological systems are nucleated in the business environment, which is internal to the business environment which the firm thrives. The economic system consists of external and internal forces that contribute to the undulation of activity of the organization, consumers and monetary and fiscal policies. A country's economic resource consists of land, labour, capital and population/human resource-which when developed and processed through education and skill training, becomes human capital.

Economic Prosperity is the maintenance of high and stable levels of economic growth and employment. The external economic forces are the life cycles, business cycle changes, inflation, interest rates, international economics, consumer sentiments, and technology, government [changes in law, regulation, taxation, and political environment]. The internal forces of countries economic system consists of the industries, the companies and labor force. The level of a country's productivity impacts on its long term growth. **Social Equity** is the social progress and the recognition of the basic needs of everyone. **Environmental Sustainability** is the prudent use of natural resources and effective protection of the environment.

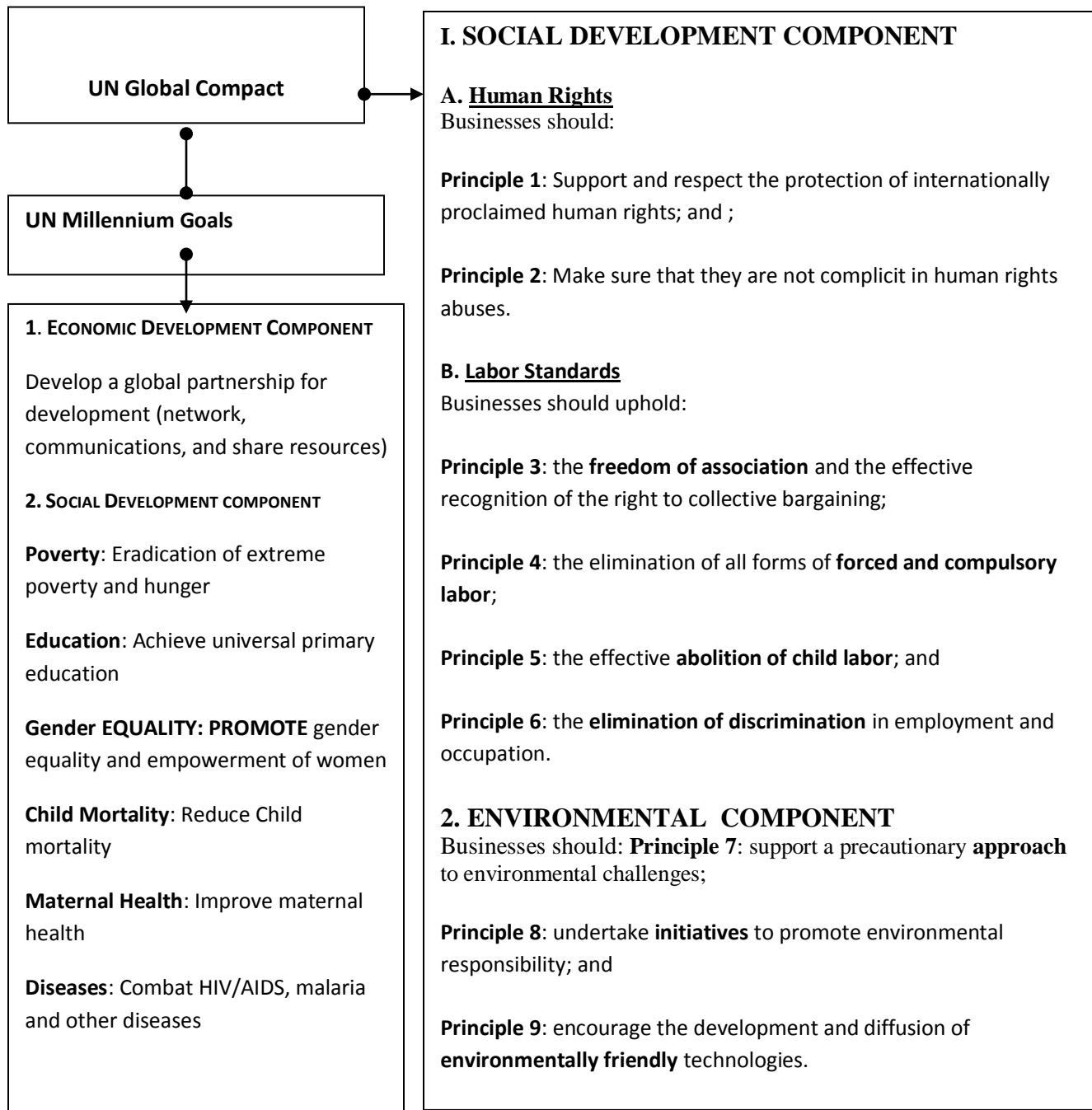
Positioning African Governments for Sustainable Development Investment



POLICIES: Business Environment

In business environment within the **SDI Ecological System**, the UN Global Compact and UN Millennium Goals can guide firms to integrate the economic, social and environmental variables within their organization charter so that the objectives and goals can be align with the compact and the Millennium Goals. The firm may customize the compact and goals according to its goals and objective because each firm has different products and services to offer to its customer.

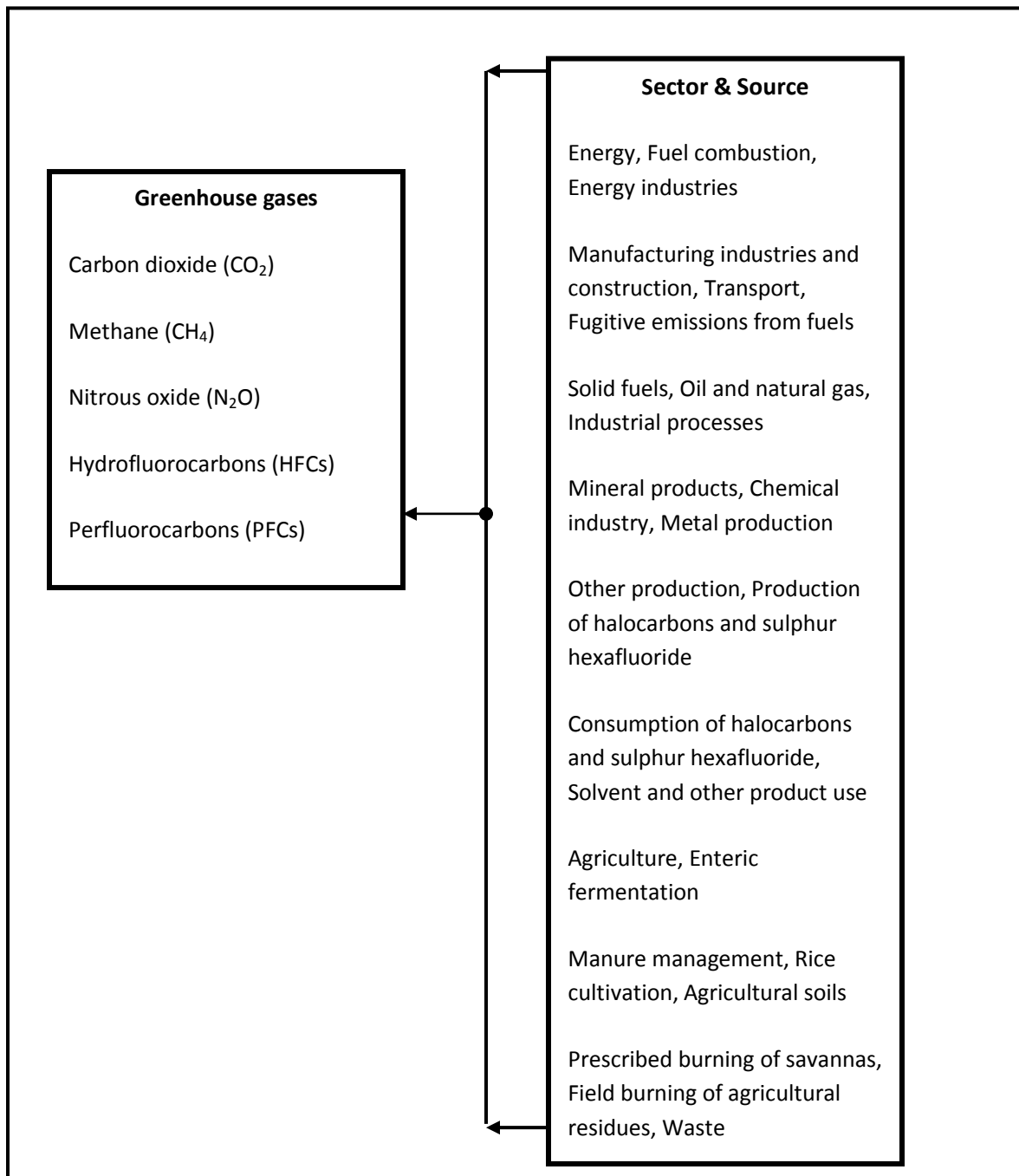
Internal business environment policy variables



Natural Environment Policies

PROTECTION of Africa's Ozone Layer

MONTREAL PROTOCOL: The **Montreal Protocol on Substance that Deplete the Ozone Layer** is an international treaty that was signed into a successful agreement on January 1, 1989 to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons that have been shown to play a role in ozone depletion. There are several groups of halogenated hydrocarbons that contribute to the ozone depletion. These ozone depleting substances contain either chlorine or bromine.



Purpose of Montreal Protocol Treaty: The purpose of the Montreal Protocol Treaty is for signatory nations to “recognize that world-wide emissions of certain substances can significantly deplete and otherwise modify the ozone layer in a manner that is likely to result in adverse effects on human health and the environment..., Determined to protect the ozone layer by taking precautionary measures to control equitably total global emissions of substances that deplete it, with the ultimate objective of their elimination on the basis of developments in scientific knowledge ... Acknowledging that special provision is required to meet the needs of developing countries... .” Thus, for each group of greenhouse gas, there is a timetable for phasing out and eliminate emission. The availability of updated scientific information accelerates the firm’s understanding with scientific and technological research results.

CORPORATIOS, AFRICAN GOVERNMENT & THE MONTREAL PROTOCOL

As scientific information and technical advances becomes publicly available, firms and government are able to utilize the disseminated knowledge to align and integrate their goals, objectives and investment opportunities with environmental protection agreement. The long term goal if for firms and government to become supporters of international efforts to protect the ozone layer.

In business environment within the **SDI Ecological System**, governments must consider ratification of amendments to integrate the Montreal Protocol [which should include the Vienna Convention for the Protection of the Ozone Layer 1985 and the Montreal Protocol on Substances that Deplete the Ozone Layer 1987,London (1990), Copenhagen (1992), Vienna (1995), Montreal (1997) and Beijing (1999)].

Collaboration with other business entities and government, dissemination and fair exchange of knowledge can be accomplished by establishing forums, conferences, seminar and workshops for managers, leaders, decision makers and civil society on an annual basis. These annual meetings will enable firms and government to monitor progress, obtain current knowledge update scientific information and take decisions to improve compliance with the Protocol. Collaboration and consesus among firms and government to protect the ozone layer is an effective measure for preventing depletion of the ozone layer.

AFRICA & KYOTO PROTOCOL

MITIGATION OF COLLECTIVE EMISSIONS OF GREENHOUSE GASES IN AFRICA

The Kyoto Protocol has been ratified by 178 countries. The agreement for the reduction of global greenhouse gas emissions by requiring developed countries to meet the national targets for greenhouse gas emissions over the period of 2008 to 2012. Developed countries are required to manage greenhouse gas emissions in their domestic atmosphere. Countries that do not meet their emissions reduction targets during the five years of 2008 -2012 period can become liable for 30% penalty (i. e., Country X exceeds its target by 100 million tons during 2008-2012 would have 130 million tons deducted from its allowable emissions in the next five year cycle greenhouse gas emissions balance sheet. Furthermore, through the greenhouse gas emissions post project management assessment, which operates on a five year cycle, the process of monitoring, evaluating and reporting will establish a tracking system for countries to maintain their target, at minimum and achieve success of the Kyoto Protocol.

Under the Kyoto Protocol, signatory countries are required to meet their targets primarily through domestic action. For example, since the United States is labeled as one of the large emitters of greenhouse gases, then it would be responsible for “sequestering CO²” that it emits in its atmosphere. The plan for the United States government [beginning 2009] is to implement an “economy-wide cap-and-trade program to reduce greenhouse gas emissions 80 percent by 2050.” The three types “flexibility mechanism” that is established by the Kyoto Protocol, are based on the principle that the benefit to the atmosphere in reducing emissions is standard, regardless of geographical location. The Protocol enables the global community to reduce emissions where it is the most cost-effective, with respect GDP per capita, varying spectrum of economic growth and the overall condition of the world economy of signatory countries. The first flexible mechanism is “**Clean Development Mechanism (CMD)**”, which is comprised of three submechanisms (CDM 1-3), enables developed countries and firms to undertake projects to reduce emissions in developing countries and to receive emissions credits in return to support sustainable development in the long run. Firstly, (CDM 1), The approved CDM **projects** must lead to a reduction in emissions that exceeds business goals. Secondly, (CDM 2), the achievement of “**Certified Emissions Reductions (CERs)**,” which is the greenhouse gas emissions achieved by the project, can be counted towards the developed country’s emissions target. Thirdly, (CDM 3), the **CDM networking opportunity**, which allows for developing countries to participate in efforts to reduce emissions, and to benefit from economic investment in their respective countries. The second flexible mechanism is the **Joint Implementation (JI)**, which is comprised of three submechanisms (**JI 1-2**), enables developed countries and firms to invest in projects to reduce emissions in other developed countries. The first joint implementation submechanism, (JI -1), is approved JI projects must also lead to a reduction in emissions that exceeds business goals. The second joint implementation submechanism, (JI -2), allows for countries [or firms] to invest in a project that would entitle it to emission credits-known as “Emission Reduction Units (ERUs),” that can be counted towards its

own emission targets. Finally, the third flexible mechanism is **International Emission Trading (IET)**, which enables developed countries that emit less than their targets to sell their surplus credits (**Assigned Amount Units [AAUs]**) to countries that have not met their targets. Under the IET, the **Domestic Emission Trading Schemes** enables government as a means of reducing national emissions levels. Countries can design the rules of their emission trading plans to link with credit that are generated by the flexibility mechanisms. Countries are advised to establish national registry system, which tracks and record all trade emissions credits, including CERs and ERUs. Thus, the price of these credits can be determined by the market.

CORPORATIONS, AFRICAN GOVERNMENT & THE KYOTO PROTOCOL

The Kyoto Protocol outlines methods in which developed countries and developing countries can manage and explore investment opportunities while decreasing their countries' greenhouse gas emission. Linkages are established among countries and regional cooperation in leveraging the surplus emission from one country with countries that exceeds the targets goals of less greenhouse gas emission. Hence, the incentive is created for sequestering and trading carbon dioxide and other greenhouse gases. Sectors such as energy industries [with renewable and non renewable], waste handling and disposal, agriculture, manufacturing emissions, and fugitive emissions from fuels, all presents investment opportunities for both firms and government.

In business environment within the **SDI Ecological System**, implementing the Kyoto Protocol presents many investment opportunities. Firstly, consideration must be given for the reporting requirements for signatory countries to submit an "Initial Report under the Kyoto Protocol" within 12 months of their ratification. For example, the United States, during the commitment years, are required to report their annual emissions. Secondly, when firms and government establish the SDIPMP with SDPMP within their business organ, new investment opportunities [approximately USD\$5 billion in 2006] are achievable with an integrated tracking system from setting up a national registry and collaboration with government to design and establish an operating function of a "national authority," which is to be in compliance with Kyoto Protocol requirements. Firms can participate in the global carbon markets to diversify the SDIPMP portfolio through the SDIPMO business organ.

INVESTORS AND CORPORATION BUSINESS ROLE & PARTICIPATION

Sustainable development & business activities: business is part of the solution for achieving sustainable development, and project investment in economic development, social development and environmental development can be a long term growth strategy; it is feasible for firms to adopt sustainable development in its operations, management and business activities. **Partnership:** establishment of partnership between firms and government is necessary for services such as energy, water, health care and infrastructure. **Poverty eradication program:** business are advise to develop a poverty eradication program in the community in which it exists and function. **Transparency and accountability:** Open market operations that are transparent and accountable are needed for business success. **Corporate governance** and regulation policies can enable government to achieve sustainable development. **Innovation:** Businesses are the major source of technology and knowledge and society benefits from the firms' innovation. **Production process:** Businesses are to consider the long term benefits to align and balance its business activities, and production process on being environmentally responsible.

INDUSTRY POLICIES (ORGANIZATIONAL CLASSIFICATION AND SPECIALIZATION)

Technology: promoting the adoption and use of environmentally sound technologies (ESTs) with a focus on the environmental management of cities and freshwater basins, in developing countries and countries in transition. **Manufacturing, production and consumption:** re-engineering' the production and consumption patterns to improve resource efficiency through cleaner technology, products and services and environmental management systems. **Chemicals:** ensuring global chemical safety through negotiations of legally binding instruments [codes of conduct and corporate social responsibility pledge] and build national chemical safety capabilities through information exchange, training and capacity building. **Energy:** addressing consequences of energy production and use, such as global climate change and local air pollution, adoption of ozone-friendly and energy-efficient practices, policies and supports the Climate Change Convention. **Economic and trade:** working with government to create dialogues and action plan for **interlinkages** and complementarities between trade, environment and development. Firm's regional operations, as multinationals, can establish a **regional branch** to ensure its effort towards achieving sustainable development. **Tourism:** management of protected or sensitive areas, and supporting the implementation of multilateral environmental agreements relevant to tourism. **Transportation:** [airline, automotive, railroad, other transport industry] can play their part, according to their firm's specialization, in the sustainable development biosphere by developing a platform to share environmental best practice experience, develop cleaner fuels, improve the environmental performance of the air transport sector and to develop new strategies for sustainable mobility.

ADDRESSING THE UN MILLENNIUM GOALS IN THE SDIPMP PORTFOLIO

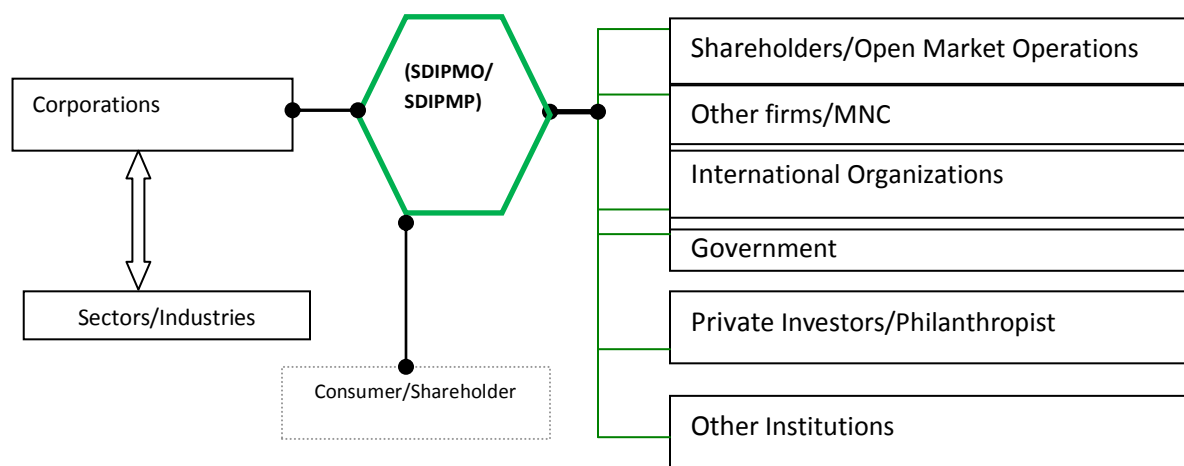
UN Millennium Goals

1. Eradication of extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empowerment of women
4. Reduce Child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

These **goals** gauges project investment opportunities to collaboratively eliminate poverty, development of sound investment climate, mobilize labor force to create jobs, achieve economic growth and creating a venue for poorest members of society to participate in the labor force and achieve self sustainability and financial independence. Furthermore, the World Bank has identified **four factors** that must be resolved before developing countries can achieve economic growth and attract business and/or foreign direct investment; firstly, developing countries has to "strengthen and educate their government officials by **building capacity**." Secondly, developing countries has to implement legal and judicial system that allows for monitoring, evaluation and transparency that can increase business investors and financiers confidence and to protect individual and property rights and regard contracts as binding in business transaction for **creating infrastructure**. Thirdly, developing countries should ensure a **robust financial system** that can capacitate

microcredit to finance larger corporate ventures, [working with the financial system already in place], for developing and/or enhancing the financial systems. Fourthly, **combating corruption** can be achieved by monitoring & evaluation, increase transparency and holding individual administrators accountable for acts of bribery, perjury, fraud and/or theft, and increase awareness of the repercussions of corruption by education programs for administrators, staff and government officials.

Positioning the corporation for Sustainable Development Investment in Africa

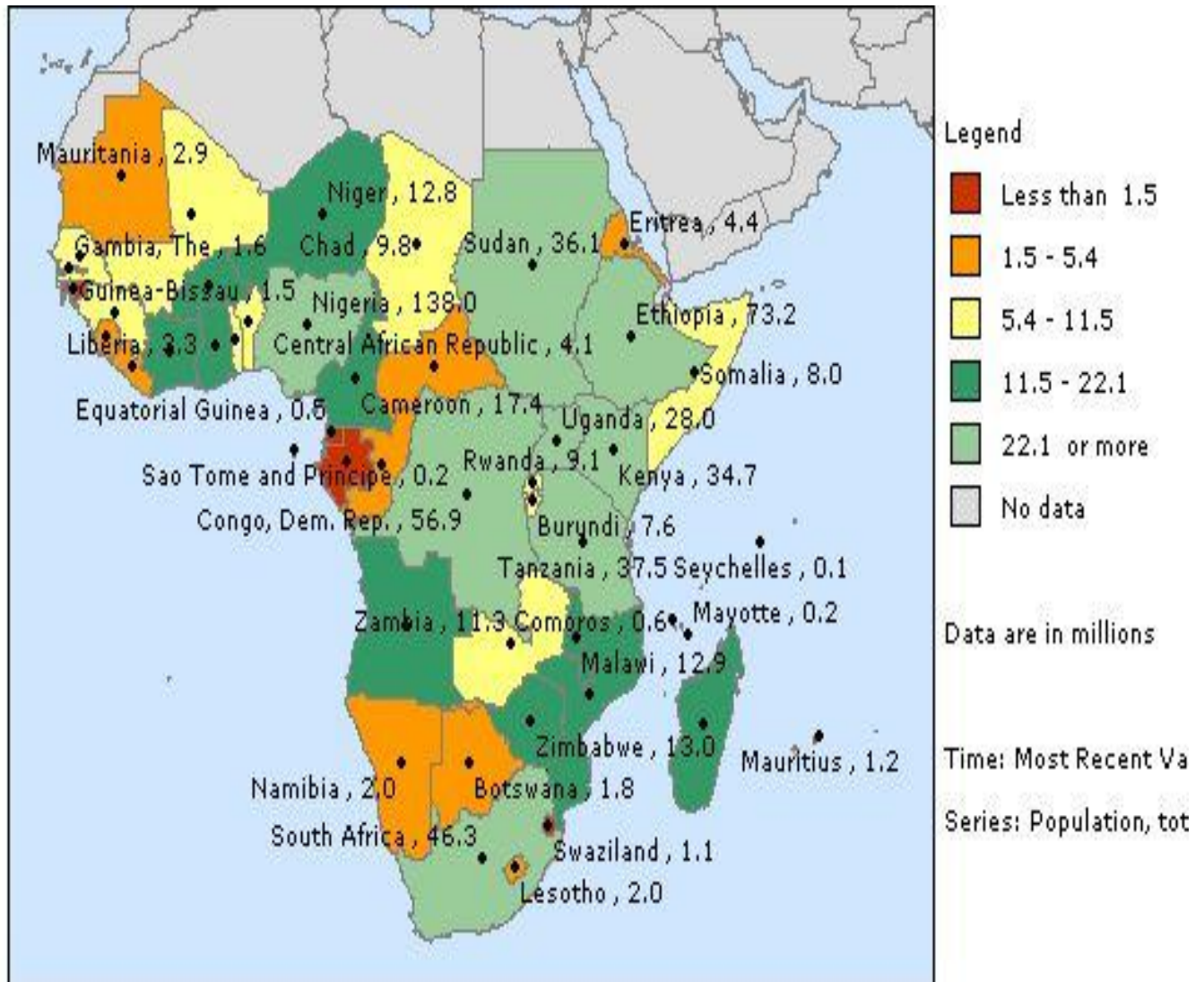


Investors and Corporations Business Role & Participation in Africa Economies

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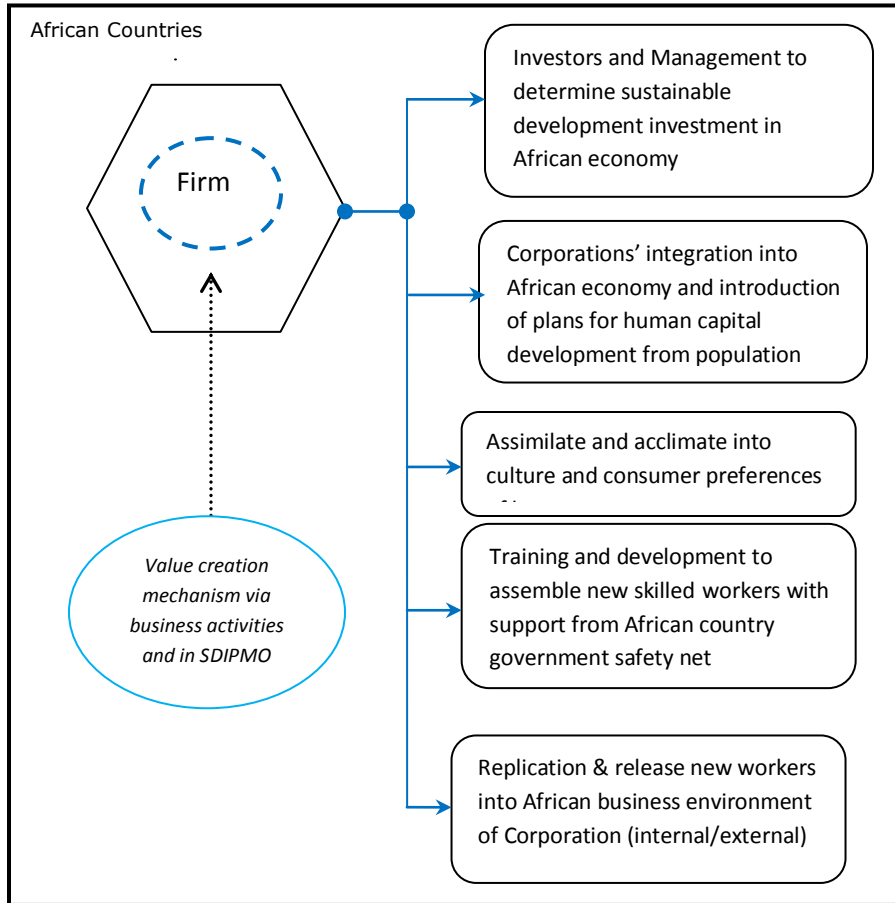
II. Africa, The Source of Wealth of Nations



Source: www.worldbank.org

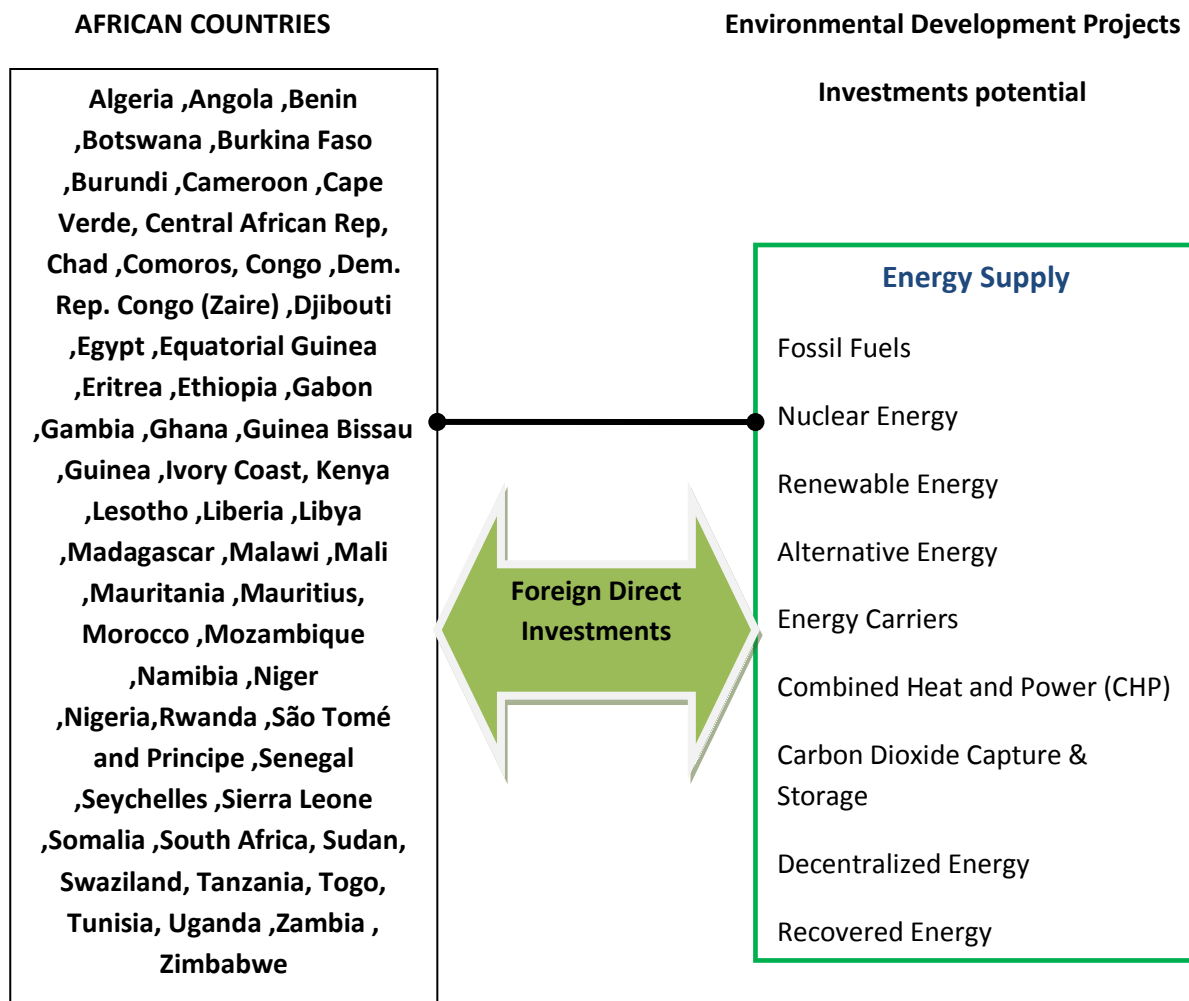
Human intellect is an infinitely renewable resource- Ernesta Ballard, Weyerhaeuser

Converting African local population into human capital development



NATURAL RESOURCES FROM AFRICAN COUNTRIES

Each country in Africa is unique in its business environment, economic environment and natural environment and its position in the international market. These diversification is beneficial for sustainable development investment. Cross government collaboration among African countries can position Africa as a complete player in sustainable development, domestically and internationally. Through the SDIPMO and SDIPMO, the infrastructure to facilitate and sequestering investment opportunities in sustainable development, renewable energy, carbon finance and all relevant green investments , prepares African countries for influx of Foreign Direct Investment and Sustainable Development Investment and mitigate the level of exploitation of resources from Africa as a cost savings strategy, in creating a mutually beneficial management and strategies plans to ensure the balance among economic development, social development and environmental development.



ENERGY SUPPLY OF AFRICAN COUNTRIES

Fossil Fuels (Coal, peat, oil, natural gas, petroleum)

Nuclear Energy- using nuclear technology to extract usable energy from atomic nuclei through controlled nuclear reactions. Currently, nuclear fission produces power to heat water to produce steam converted into mechanical work for generating electricity or propulsion.

Renewable Energy – wind, solar, biomass, tidal technology, and geothermal

Classification of Renewable Technology

Renewable-energy (According to IPCC), technologies can be broadly classified into four categories:¹

1) *technologically mature with established markets in at least several countries*:– large and small hydro, woody biomass combustion, geothermal, landfill gas, crystalline silicon PV solar water heating, onshore wind, bioethanol from sugars and starch (mainly Brazil and US);

2) *technologically mature but with relatively new and immature markets in a small number of countries*:– municipal solid waste-to-energy, anaerobic digestion, biodiesel, co-firing of biomass, concentrating solar dishes and troughs, solar-assisted air conditioning, mini- and micro-hydro and offshore wind;

3) *under technological development with demonstrations or small-scale commercial application, but approaching wider market introduction*:– thin-film PV, concentrating PV, tidal range and currents, wave power, biomass gasification and pyrolysis, bioethanol from ligno-cellulose and solar thermal towers; and

4) *still in technology research stages*:– organic and inorganic nanotechnology solar cells, artificial photosynthesis, biological hydrogen production involving biomass, algae and bacteria, biorefineries, ocean thermal and saline gradients, and ocean currents.

¹ Sims, R.E.H. et.,al. (2007). <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter4.pdf> .

INVESTING IN AFRICA'S OCEAN ENERGY²

Africa is surrounded by the **Atlantic Ocean, South Atlantic Ocean, Indian Ocean, Arabian Sea, Red Sea and Mediterranean Sea.**

Extracting electrical energy from *marine currents* could yield in excess of 10 TWh/yr (0.4 EJ/yr) if major estuaries with large tidal fluctuations could be tapped, but cost estimates range from 450–1350 US\$/MWh (IEA, 2006a). A 1 km-stretch of permanent turbines built in the Agulhas current off the coast of **South Africa**, for example, could give 100 MW of power (Nel, 2003). However, environmental effects on tidal mud flats, wading birds, invertebrates etc. would need careful analysis. In order for these new technologies to enter the market, sustained government and public support is needed. *Ocean thermal* and *saline gradient* energy-conversion systems remain in the research stage and it is still too early to estimate their technical potential. Initial applications have been for building air conditioning (<http://www.makai.com/p-pipelines.htm>) for desalination in open- and hybrid-cycle plants using surface condensers and in future could benefit tropical island nations where power is presently provided by expensive diesel Generators. Also, for tidal technology, SWANTRBINES of Whales, United Kingdom has developed the system for tidal “Stream turbines for emerging marine renewable energy). See <http://www.swanturbines.co.uk> for potential venue for Africa Ocean Energy projects.

Energy Carriers are electricity, heat and solid, liquid and gaseous fuels. They occupy intermediate steps in the energy-supply chain between primary sources and end-use applications. An energy carrier is thus a transmitter of energy. For reasons of both convenience and economy, energy carriers have shown a continual shift from solids to liquids and more recently from liquids to gases (WEC, 2004b), a trend that is expected to continue. At present, about one third of final energy carriers reach consumers in solid form (as coal and biomass, which are the primary cause of many local, regional and indoor air-pollution problems associated with traditional domestic uses); one third in liquid form (consisting primarily of oil products used in transportation); and one third through distribution grids in the form of electricity and gas. The share of all grid-oriented energy carriers could increase to about one half of all consumer energy by 2100, (Sims,et. al.,2007)

Electricity is the highest-value energy carrier because it is clean at the point of use and has so many end-use applications to enhance personal and economic productivity. It is effective as a source of motive power (motors), lighting, heating and cooling and as the prerequisite for electronics and computer systems. Electricity is growing faster as a share of energy end uses than other direct-combustion uses of fuels with the result that electricity intensity (Electricity/GDP) has remained relatively constant even though the overall global energy intensity (Energy/GDP) continues to decrease. If electricity intensity continues to decrease due to efficiency increases, future electricity demand could be lower than otherwise forecast

² Sims, R.E.H. et.,al. (2007). <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter4.pdf> .

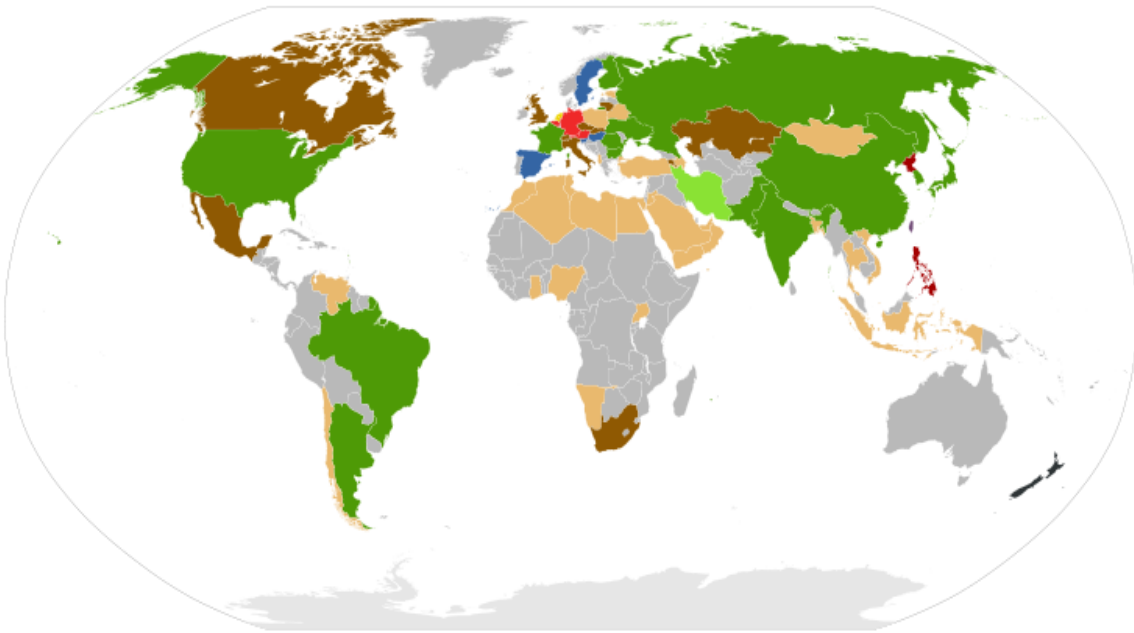
NOTE: Each energy-conversion step in the supply chain invokes additional costs for capital investment in equipment, energy losses and carbon emissions. These directly affect the ability of an energy path to compete in the marketplace. The final benefit/ cost calculus ultimately determines market penetration of an energy carrier and hence the associated energy source and endues technology (Sims, et. al.,2007).

Energy Carriers of Hydrocarbon substances

Primary Energy	Solid	Slurry	Liquid	Gas
Coal	Pulverized coal Coke	Coal/water mix Coal/ oil mix	Coal to liquid (CTL) Synthetic fuel	Coal gas Producer gas Blast furnace gas Water gas Gasified fuel Hydrogen
Oil			Oil refinery products	Oil gas Synthetic gas Hydrogen
Natural gas			LNG, LPG Gas to liquid (GTL) GTL alcoholics Di-methyl ethers	Methane Hydrogen
Biomass	Wood residues Energy crops Refuse derived fuel (RDF)		Methanol Ethanol Biodiesel esters Di-methyl ethers	Methane Producer gas Hydrogen










Source: Sims,et. al,2007

MAP OF NUCLEAR POWER BY COUNTRIES



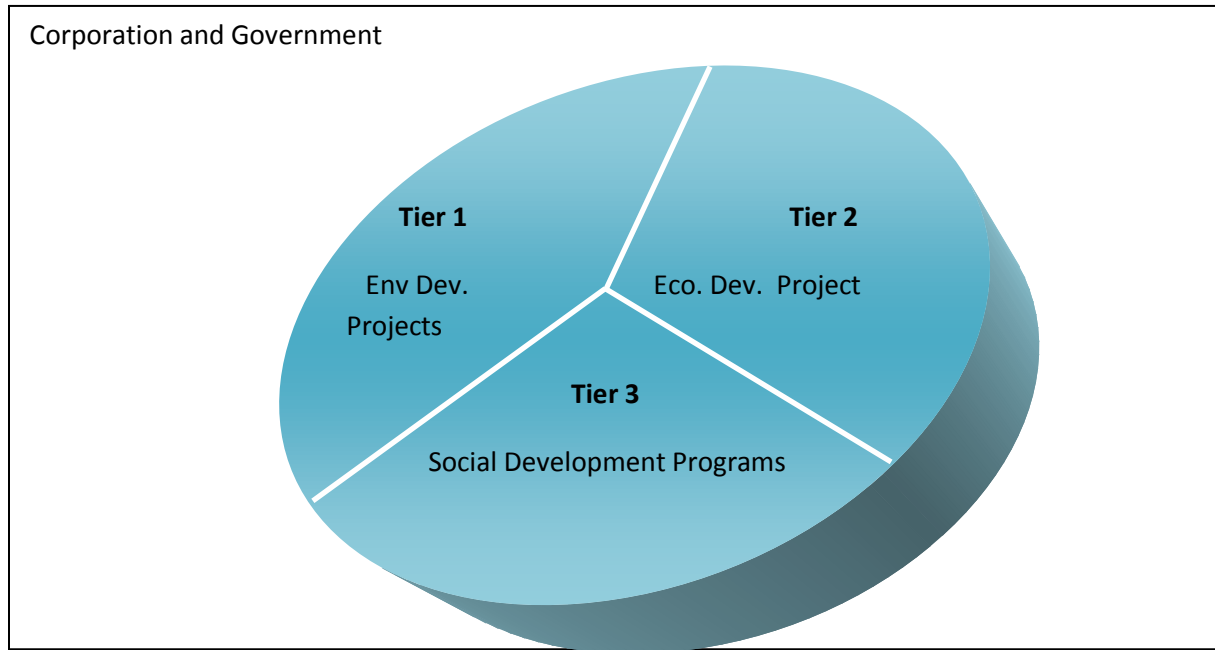
Key

Countries with nuclear power plants.

-  Building new reactors
-  Building their first reactors
-  Planning/considering new reactors
-  Planning/considering their first reactors
-  Operating reactors, but no plans for expansion or phase-out
-  Formerly had commercial reactors, but which have all been phased out
-  Operating reactors and considering phase-out
-  [Nuclear-free](#)
-  No reactors.

Investment: Model & Planning

Sustainable Development Investment Project Management Portfolio (SDIPMP)



Diversification Strategy: Each SDIPMP will vary within firms, among industries, country/government, private investors, financial institutions, depending on available natural and financial resources with the feasibility of return on investments, in the context of the internal and external forces of the business environment, economic environment and natural environment.

Sustainable Development Investment Project Management Portfolio (SDIPMP)

SDIPMP is a collection of **Tier 1 Projects (environmental development projects-** conservation and preservation, alternative energy, renewable energy, ensure environmental sustainability, education and awareness), **Tier 2 projects (economic development projects-** private sectors development linkages to local small to medium enterprise, community development, technology transfer, joint venture with government of host countries, contribute to human capital development of local population, urban development of rural areas, creating jobs opportunities, development of entrepreneurs, promote education programs), and **Tier 3 Projects (social development projects-** eradication of poverty, achieving universal primary education, gender equality and empowerment of women, reduction of child mortality, improvement of maternal health, combat HIV/AIDS, malaria and other diseases, , establish global partnership for development and promote world peace by addressing issues of war, prevention of genocide and social injustice that fracture the progress towards human development), and mix method of **Tier 4 Projects (combination of Tier 1, Tier 2 and/or Tier 3**

Projects investments).Cross section investments can be explored among industry members, government and international organizations, coupled with the ant combination of tier project investments. Establishment of an **Industry Trust Fund** can be explored among firms, government and international organization. The objective of the Industry Trust Fund is to establish a sense of community among competitors to address the challenges facing global societies and strive towards the common goal of achieving sustainable development and environmental conservation, preservations and protection.

INDUSTRIAL PLANNING FOR SUSTAINABLE DEVELOPMENT INVESTMENT:

CREATING COMMUNITY AMONG COMPETITORS

- **Among Industries³ : AFRICAN INDUSTRIES⁴**

Agriculture, Forestry and Fishing	Manufacturing
Arts and Crafts	Materials Handling
Automotive	Media
Building, Construction and Civil Engineering	Mining
Chambers of Commerce	Miscellaneous
Chemicals	Oil and Gas
Computers and Communications	Packaging
Development	Professional Services
Electrical Power	Public Utilities
Energy	Pulp and Paper
Engineering	Real Estate
Equipment	Security
Exchanges	Textiles and Clothing
Exhibitions, Trade Shows and Conferences	Trading
Financial Services	Transport and Storage
Food, Beverages and Tobacco	Travel, Tourism and Recreation
Government	Waste Management, Pollution Control and Recycling
Health Services	Wholesale and Retail

³ United States Department of Labor

⁴ Source: MBendi. http://www.mbendi.com/a_sndmsg/Indy_List.asp?P=0&R=0 . Retrieved on August 29,2009.

Among Countries⁵

Africa, East Asia & Pacific Europe and Central Asia, Latin America & Caribbean, Middle East & North Africa, South Asia

Corporate Strategy and SDIPMP

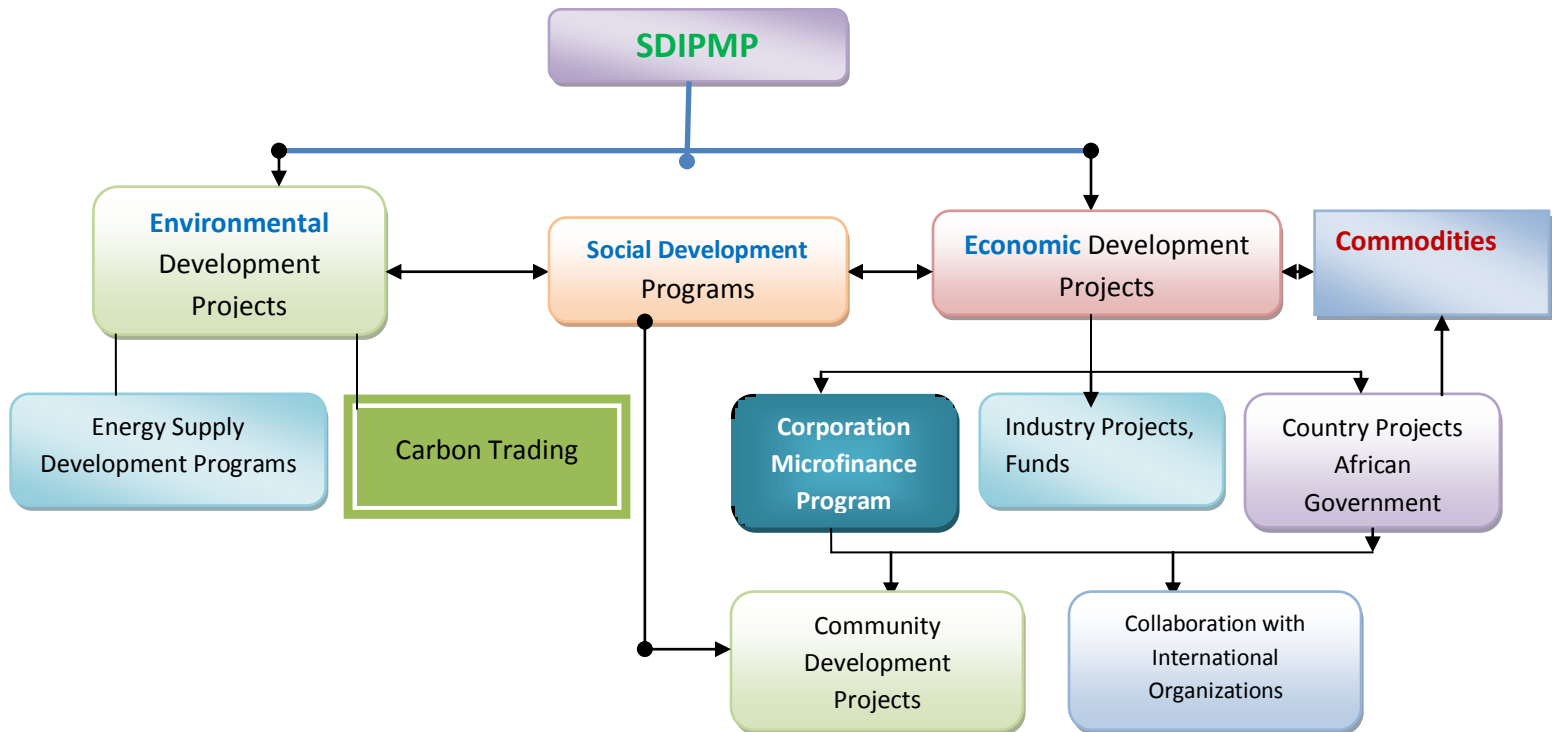
The **SDIPMP** of environment, economic and social development projects or programs within and/or among industry collaboration are grouped together to facilitate investment potential for achieving the firms, government or organizations strategic objectives. SDIPMP projects and programs can be measured, ranked and prioritize. The projects and programs, subportfolio and other sustainable development investments within SDIPMP depend on the strategic goals of the firm, government or organization.

⁵ World Bank classification

SETTING UP THE SUSTAINABLE DEVELOPMENT INVESTMENT PROJECT MANAGEMENT PORTFOLIO

Projects and Programs for Africa Sustainable Development Investments

Corporations and African Governments



SDIPMP Investment Variables ⁶

1. SOCIAL DEVELOPMENT PROGRAMS

a. World Largest Refugee Camp-Dadaab Refugee Camp, Kenya-

<http://blogs.tampabay.com/photo/2009/08/dadaab-home-to-more-than-289500-is-the-worlds-largest-refugee-camp.html>

The Dadaab complex in northeastern Kenya consists of three separate camps, has been in operation for 18 years and is currently home to over 289,500 inhabitants. Most are Somalis fleeing the escalating violence in that country. Dadaab currently holds three times as many people as it was designed. About 43,000 new refugees arrived this year alone. The Kenyan government has recently started moving some to another camp which is a three-day bus ride away

b. Eradicate extreme poverty and hunger –

Indicators : Employment to population ratio, 15+, total (%), Employment to population ratio, ages 15-24, total (%), GDP per person employed (annual % growth), Income share held by lowest 20%, Malnutrition prevalence, weight for age (% of children under 5), Poverty gap at \$1.25 a day (PPP) (%), Poverty headcount ratio at \$1.25 a day (PPP) (% of population), Prevalence of undernourishment (% of population), Vulnerable employment, total (% of total employment)

c. Achieve universal primary education

Indicators: Literacy rate, youth female (% of females ages 15-24), Literacy rate, youth male (% of males ages 15-24), Persistence to last grade of primary, total (% of cohort), Primary completion rate, total (% of relevant age group), Total enrollment, primary (% net).

d. Promote gender equality and empower women

Indicators: Proportion of seats held by women in national parliaments (%), Ratio of female to male enrollments in tertiary education, Ratio of female to male primary enrollment, Ratio of female to male secondary enrollment, Share of women employed in the nonagricultural sector (% of total nonagricultural employment).

e. Reduce child mortality

Indicators: Immunization, measles (% of children ages 12-23 months), Mortality rate, infant (per 1,000 live births), Mortality rate, under-5 (per 1,000),

f. Improve maternal health

Indicators: Adolescent fertility rate (births per 1,000 women ages 15-19), Births attended by skilled health staff (% of total), Contraceptive prevalence (% of women ages 15-49), Maternal mortality ratio (modeled estimate, per 100,000 live births), Pregnant women receiving prenatal care (%), Unmet need for contraception (% of married women ages 15-49)

g. Combat HIV/AIDS, malaria, and other diseases

Indicators: Children with fever receiving antimalarial drugs (% of children under age 5 with fever), Condom use, population ages 15-24, female (% of females ages 15-24), Condom use, population ages 15-24, male (% of males ages 15-24), Incidence of tuberculosis (per 100,000 people), Prevalence of HIV, female (% ages 15-24), Prevalence of HIV, male (% ages 15-24),

⁶ World Bank Indicators

Prevalence of HIV, total (% of population ages 15-49), Tuberculosis cases detected under DOTS (%).

2. ENVIRONMENTAL DEVELOPMENT PROGRAMS

- **Ensure environmental sustainability**
- Indicators: CO2 emissions (kg per PPP \$ of GDP), CO2 emissions (metric tons per capita), Forest area (% of land area), Improved sanitation facilities (% of population with access), Improved water source (% of population with access), Marine protected areas, (% of surface area), Nationally protected areas (% of total land area)
- **African Energy Supply:** Fossil Fuels, Nuclear Energy, Renewable Energy, Energy Carriers, Combined Heat and Power (CHP), Carbon Dioxide Capture & Storage, Decentralized Energy, Recovered Energy
- **African Commodities Supply**

3. ECONOMIC DEVELOPMENT PROGRAMS(Ex: Pioneer of Economic Development for China in Case of ShenJen : Dun Seou Ping famous speech for adventurous spirit in Reform and Opening up, transform from a fishing village into major modern city, which is now manufacturing and shipping heart of China , from the pioneering spirit.⁷

- Develop a global partnership for development
Indicators: Aid per capita (current US\$), Debt service (PPG and IMF only, % of exports, excluding workers' remittances), Internet users (per 100 people), Mobile cellular subscriptions (per 100 people), Telephone lines (per 100 people)
4. **COUNTRY OVERVIEW- Indicators:** Fertility rate, total (births per woman), GNI per capita, Atlas method (current US\$), GNI, Atlas method (current US\$) (billions), Gross capital formation (% of GDP), Life expectancy at birth, total (years), Literacy rate, adult total (% of people ages 15 and above), Population, total (millions), Trade (% of GDP).

The SDIPMP portfolio reflects the investments made or forecasted by the Corporations or government with African countries, which are to be in alignment with the goals and objectives. Here is where prioritization is identified, sustainable development investment decisions are made and resources are allocated. The SDIPMP exhibits specific common features, which can aid in diagnosing the nonalignment of the firms and/or government strategy.

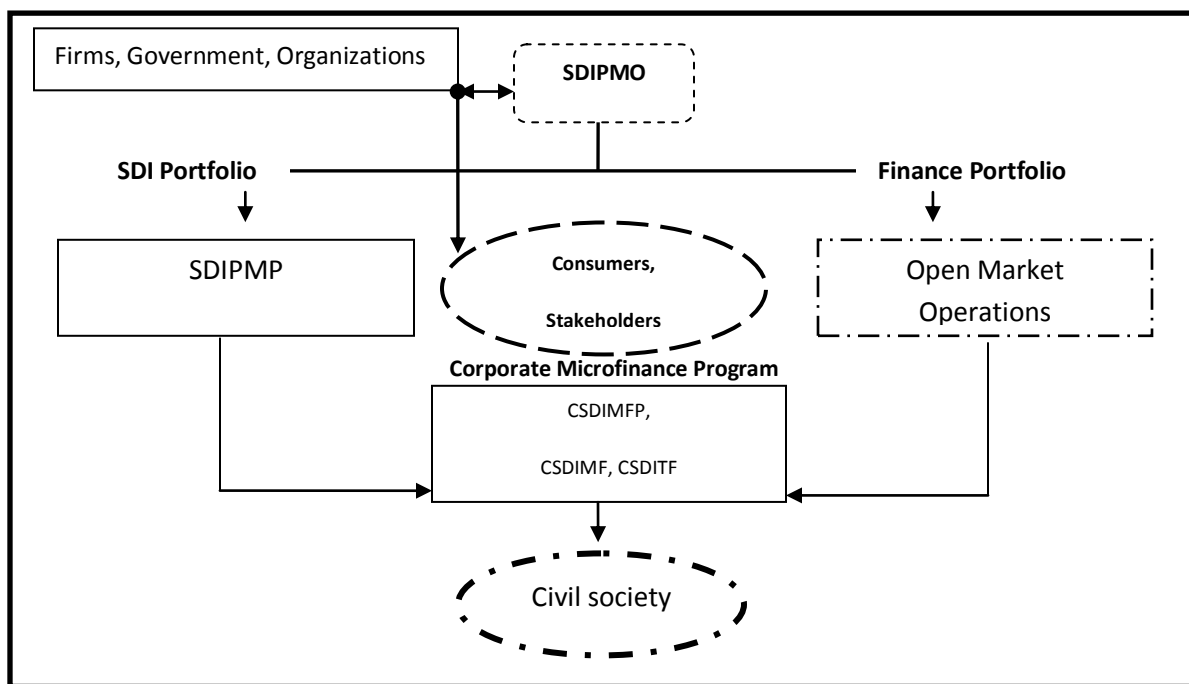
- SDIPMP portfolio represents investments made or planned in environmental, social and economic development projects of the firm and/or government.
- SDIPMP is aligned with the firms' and/or government strategic goals and objectives
- SDIPMP has the distinguishing feature of diversifying projects to minimize risk that would allow the firm and/or government to group them for more effective management.

⁷ Source: CCTV "China on the Move" ShenJen

- SDIPMP (of environmental, social and economic development projects and programs) is measurable, rankable and prioritized.

Managing SDIPMP: SDIPMP is the centralized management within the SDIPMO and it includes identifying, prioritizing, authorizing and controlling projects, programs and other related investments, to achieve specific strategic objective. The selection, prioritizing, assessing, and management of economic, social and environmental projects, programs and other SDI investment activities, coupled with alignment and input to the firm and/or government aids in achieving the strategic goals. SDIPMP combines the firms and/or government focus of ensuring that the sustainable development projects that are selected for investment meet the portfolio strategy with focus of delivering each project effectively and within the planned contribution to the portfolio.

FIGURE: GENERIC MIX STRATEGY: SUSTAINABLE DEVELOPMENT INVESTMENT



N.B. The generic mix strategy for sustainable development investment will vary within firms, among industries, country/government, private investors, financial institutions, depending on available natural and financial resources with the feasibility of return on investments, in the context of the internal and external forces of the business environment, economic environment and natural environment.

Developing, transitional and perhaps emerging markets economies may set up SDIPMO as part of its government until their financial markets and institutions matures, become competitive players for SDI and attract foreign direct investments from banks and other government. This division will be treated in accordance with regulations and international standards for accountability, monitoring and evaluation, transparency to compete in the domestic and international markets.

MANAGEMENT

SETTING UP THE SUSTAINABLE DEVELOPMENT INVESTMENT PROJECT MANAGEMENT OFFICE (SDIPMO)

DEPARTMENT OF SUSTAINABLE DEVELOPMENT INVESTMENT

INVESTORS, CORPORATIONS

Identify mission, objectives, goals
and strategy for Sustainable Dev.

Determine total work

Arrange work into manageable
parts

Define individual and collective role

Define policies, methods, techniques,
procedure

Prepare position description

Assign individuals to positions

Alignment

AFRICAN GOVERNMENTS

Identify mission, objectives, goals
and strategy for Sustainable Dev.

Determine total work

Arrange work into manageable
parts

Define individual and collective role

Define policies, methods, techniques,
procedure

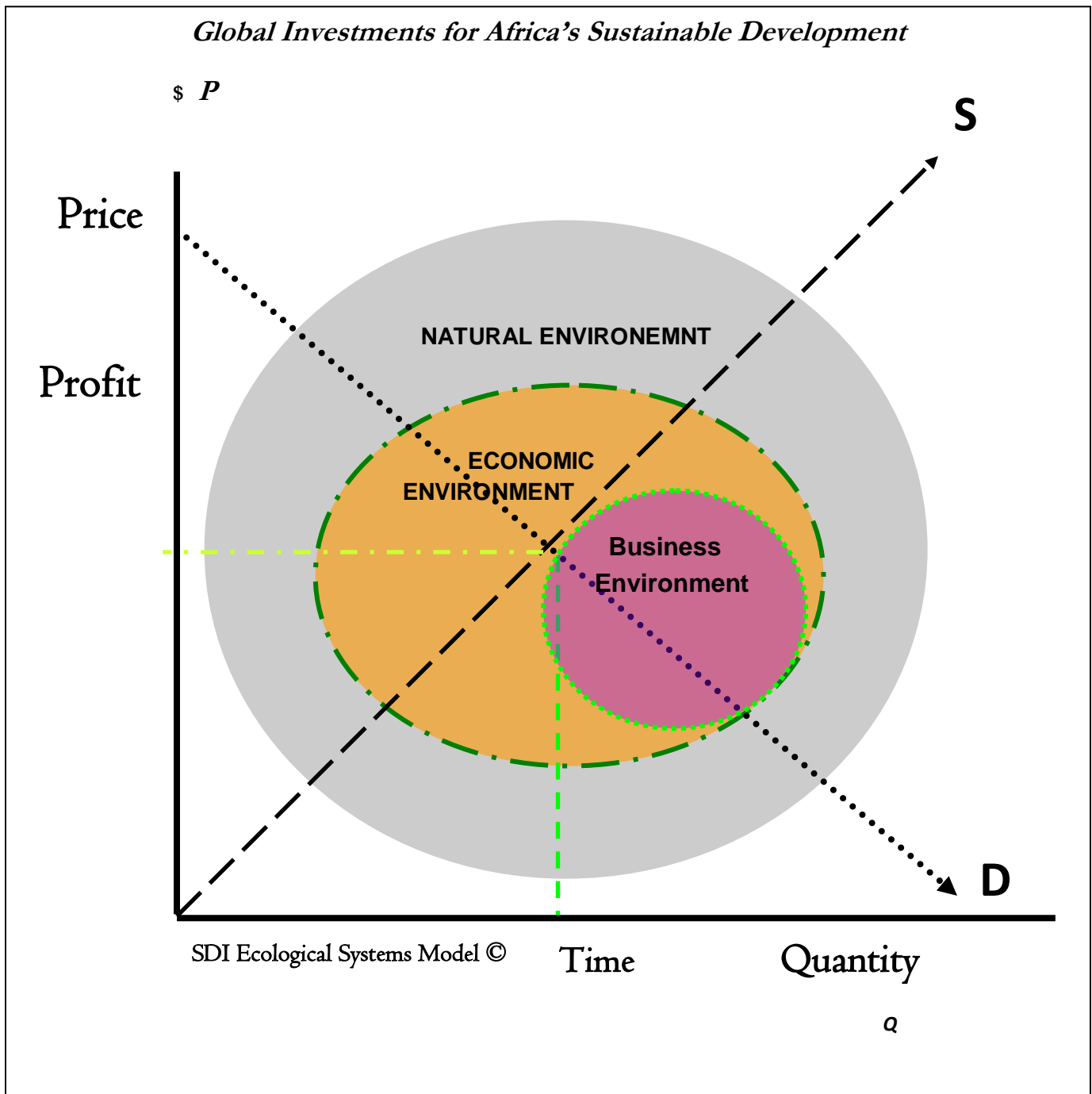
Prepare position description

Assign individuals to positions

ACHIEVING THE VIRTUOUS CYCLE OF REINTEGRATION

Firms, government, international organizations and institution of innovations and knowledge [i.e. corporation, academia], industry competitors and the development environment in the patterning of environmental events and its transition over the event's lifecycle, which is known as **Sustainable Development Chronosystem (SDC)**. The system of SDM, SDMe, SDE, SDMa, and SDC contains specific roles, norms and rules that can potentially influence and mold sustainable development, all together. Thus, through the virtuous cycle of reintegration with the establishment of the sustainable development systems and mechanism of action and the system of value creation of sustainable development equity, firms can achieve the sustainable development biosphere, which is deeply nested within the economic environment and the natural environment. The evolution of the paradigm shifts to a Sustainable Development Investment Project Management Portfolio (**SDIPMP**) via Sustainable Development Investment Project Management Office (**SDIPMO**) in the firm and the role of managers will be an ongoing effort to balance change with continuity, is at the core of sustainable development ecological systems that must become one of the firm's major business activity, among the operating activity, investing activity and financing activities, as a value generator. The Sustainable Development Investment Project Management Portfolio (SDIPMP) within the business organ of Sustainable Development Investment Project Management Office (SDIPMO) allows for value creation and preservation for the firm and its portfolio performance is accounted for as a fixed asset, tangible long term investment. Such a structure within the financial balance sheet creates an internal mechanism of actions (**MOA**) for long term capital preservation with change management and other finance dynamics and momentum to sustain shocks and downturns, internally and externally of the business environment.

Investment Ecological Map⁸



FUTURE OUTLOOK: Population, Human Capital and keeping the Land for Africans

The goal of Africa Sustainable Development Investments is to create a paradigm shift from **Debt and Aid to Assets and Trade**. Africa supplies 40% of the world natural resources and has less than 3% carbon emission. In Africa, land is a long term fixed and tangible asset. Population is an abundant source of potential human capital, of which the human intellect is an infinite source of renewable energy. Together, the relationship of population to the land is that of a virtuous cycle of reinvestment ,where cultivating the land through sustainable agriculture, development of sustainable villages, harnessing aquaculture , empowering cottage industries to create linkages to ecotourism and sustainable hospitality, is a venue for mitigating poverty and enabling population to be developed into local entrepreneurs. Furthermore, this paradigm shift will stimulate investment from **bottom up approach** by plugging the local population, development of African Social Entrepreneurs and strengthening the SMEs[small to medium enterprises] to connect back into the value chain with the local, regional and national economies, thus strengthening the economies from bottom up and creating a virtuous cycle of reinvestment and development of the business environment for further growth of the national, regional and local private sector. Africa Sustainable Development Investment is needed for, firstly, low carbon economic infrastructure, such as hydroelectricity, aradable land access, non-forested land and further investment in fiber optic bandwidth to facilitate development. Secondly, high potential low carbon sectors investments, such as fruits and vegetables, aquaculture, honey cultivation and harvesting, business process outsourcing, sustainable hospitality and resort and ecotourism, such as the case of **Tinechung Village, Cameroon from Genders Promotions Center for Africa**. Thirdly, for forest-dependent sector, reform is needed in forestry and mining, so that these sectors can function to protect Africa's forest and natural landscape. Africa's landscape is amazingly diverse, including Forests, Sahara Desert, Mountains, Savannah, and Plains, Jungles, and millions of species living in natural habitat. Fourthly, expanding access to services and create new economic opportunities for African local populations and local entrepreneurs through improve social services [including health and education], low-carbon energy sources, clean water and employment which does not threaten the forest. Fifth, Improve services to the broader African population by aiming to improve the quality of life, including improving and expanding job prospects, promoting private sector enterprise, and improving social services with particular focus on health, education, and sports. Sixth, Investments are needed in renewable energy, alternative energy, tidal technologies [Africa surrounded by six bodies of water] solar, wind ,agricultural research ,green technology, infrastructure development and heavy industry equipment for Agriculture, farming that plugs the local population, enables and develop African entrepreneurs and strengthens the role of SMEs. Conclusively, Africa is the ideal destination for green research and investments. **Global corporations' can set up its headquarters for green, alternative and renewable energy research and development centers, as well as green technology centers.** Africa is surrounded by 5 bodies of water, which gives rise for tidal technologies to generate electricity, as well as a plethora of alternative and renewable energies. The investment portfolios that emerge out Africa's supply chain of natural resources are commodities portfolio [including agriculture or farmers' portfolio], and alternative and

renewable energy portfolio. Thus, Africa continues to be the bread-basket for the world and sustainable development investment in Africa is an economic value to many nations.

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⁹ Forthcoming in December, 2009

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